TECHNICAL INFORMATION ON BUILDING MATERIALS

TIBM - 41

FOR USE IN THE DESIGN OF LOW-COST HOUSING

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THE NATIONAL BUREAU OF STANDARDS
UNITED STATES DEPARTMENT OF COMMERCE
WASHINGTON, D. C.

December 29, 1936

ROOFING TIN (TERNEPLATE) FOR HOUSE CONSTRUCTION

The principal use of terneplate in house construction is for roofing. It is also used for flashing, furnace casing and occasionally for heating and ventilating ducts.

Most ferrous metal roofs are made of terneplate. This is particularly true if the roof is flat or nearly so. Galvanized sheets, however, are occasionally used for roofs having a steep pitch and under most conditions, where so used, give greater protection from atmospheric corrosion. (See TIBM - 17 "Atmospheric Corrosion of Galvanized Ferrous Sheet Metals").[1] Some advantages of terneplate over galvanized roofing sheets are: greater pliability, possibility of making stronger soldered joints, and increased durability of ordinary paint coats (See TIBM - 28 "Painting of Ferrous Metals"), as terneplate has exceptionally good "paint-holding" properties.

Terneplate is made by passing annealed and pickled steel or iron sheets (See TIBM - 42 "Black and Galvanized Sheets in House Construction") through a bath of molten lead-tin alloy (usually 75 percent lead and 25 percent tin). By this means, the sheet is covered on both sides with a reasonably uniform coating of lead-tin alloy. To produce a good grade of terneplate, the black sheets before coating should be free from blisters, slivers, scale, laminations, open seams, dirt and grease spots, ragged edges, holes, pickling patches, stains, burnt edges, brittleness and internal or surface defects which would impair their use for terneplate manufacture. The finished terneplate sheets should also be free from the above mentioned defects, and have no bare or imperfectly coated spots, deep scratches or heavy list edges.

Open-hearth or Bessemer steel or open-hearth iron, with or without added copper for increasing atmospheric corrosion resistance, (See TIBM - 10 "Atmospheric Corrosion of Ferrous Metals") is used to make terneplate sheets. The sheets are cold-rolled, double-annealed and double-pickled, making them soft and easily workable, having a surface that will take a smooth coating,

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[1] Copies of all TIBM releases mentioned in this paper may be obtained from the National Bureau of Standards, Washington, D. C. (Free)

features which are important in the manufacture of terneplate. Very pure grades of tin and lead should be used in making the 75-25 coating alloy, Tin plus lead in the coating must be not less than 99 percent of the coating (exclusive of iron from the basis metal, which forms an alloy with the coating that provides the bond between them).

Terneplate is usually furnished for builders in Grades "IC" and "IX", the latter being the heavier gage, with about 25 percent difference in weight. The significance of these trade designations is shown by the data in Table I, which gives the weight of the black sheets for "IC" and "IX" terne, in ounces per square foot or pounds per base box, and the corresponding weights of the coated sheets for coating weights, varying from 8 to 40 pounds per box. The 25-pound terne sheet is commonly used for roofing. A "box" of terneplate consists of 112 sheets, 20 x 28 inches, which is the equivalent of 62,720 square inches or 435.56 square feet of sheet. It will be observed that Table I also contains a column expressing the weight of coating in ounces per square foot of sheet. This is the nominal weight of coating and normally varies somewhat on different parts of a sheet, but no area should have a coating less than 75 percent of that specified in Table I. The weights of terne sheets should be within the limits set in this table.

Terne sheets should withstand, without fracture, double-seaming as well as bending through 180° and flattening down with a wooden mallet on a wooden block, both tests being made with and across the direction of rolling.

Terne roofing sheets are nearly always supplied with one side painted. This is to be used as the under side in roof construction. The upper side should be painted without delay. Rusting may proceed rapidly out of doors, especially at places where the coating has been damaged (See TIBM - 17 "Atmospheric Corrosion of Galvanized Ferrous Sheet Metals"). The paint coat should be renewed as often as needed, but care should be taken not to build the coating up too thick. Useful information regarding such painting is contained in National Bureau of Standards Letter Circular No. 422 "The Painting of Structural Metal (Steel, Galvanized Metal, Tin Plate and Copper)."[1] Many other items of interest to users or purchasers of terneplate are given in Federal Specification QQ-T-201, "Terneplate (Roofing Tin)."[2]

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1 May be obtained from the National Bureau of Standards, Washington, D. C. (Free)

2 May be obtained from the Superintendent of Documents, Washington, D. C. (Price 5 cents)

TABLE I — DATA FOR COMMERCIAL TERNEPLATE

TRADE SYMBOL		WEIGHT OF BLACK SHEETS AFTER PICKLING	WEIGHT OF COATING, IN POUNDS PER BOX											
			8		15		20		25		30		40	
			WEIGHT OF COATING,* IN OUNCES PER SQUARE FOOT OF SHEET											
			0.2939		0.5510		0.7347		0.9184		1.1020		1.4694	
			WEIGHT OF FINISHED SHEETS											
		OZ/SQ FT	LB/BOX	OZ/SQ FT	LB/BOX	OZ/SQ FT	LB/BOX	OZ/SQ FT	LB/BOX	OZ/SQ FT	LB/BOX	OZ/SQ FT	LB/BOX	OZ/SQ FT	LB/BOX
IC	MINIMUM	7.00	191	7.29	199	7.55	206	7.73	211	7.92	216	8.10	221	8.47	231
	NOMINAL	8.00	218	8.29	226	8.55	233	8.73	238	8.92	243	9.10	248	9.47	258
	MAXIMUM	9.00	245	9.29	253	9.55	260	9.73	265	9.92	270	10.10	275	10.47	285
IX	MINIMUM	9.00	245	9.29	253	9.55	260	9.73	265	9.92	270	10.10	275	10.47	285
	NOMINAL	10.00	272	10.29	280	10.55	287	10.73	292	10.92	297	11.10	302	11.47	312
	MAXIMUM	11.00	299	11.29	307	11.55	314	11.73	319	11.92	324	12.10	329	12.47	339

* TOTAL FOR BOTH SIDES

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